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USE OF INFORMATION TECHNOLOGIES TO MAKE TRANSIT ARRANGEMENTS MORE EFFECTIVE

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Introduction

1. The Commission on Enterprise, Business Facilitation and Development, at its first session in January 1997, decided to convene an expert meeting on the "use of information technologies to make transit arrangements more effective". It also decided that "transit and transport facilitation issues should be considered from a technical point of view, in the broad context of trade and development, with a special focus on the specific problems of land-locked and access-granting countries".

2. Transit issues have become an area of interest for a large group of countries, as regional trade is increasing also in developing countries. Accordingly, the need to improve the functioning of transit systems is of increasing concern for all countries. The main concern for traders is that their goods should have a rapid and secure passage at a fair price. The main concerns for Customs are to ensure that goods in transit exit from the transit country or, if not, that customs duties are paid.

3. The importance of efficient transit systems, particularly but not exclusively for land-locked countries, has been emphasized in a number of studies, reports and other publications over the last 30 years. There is a general understanding that in spite of what has already been achieved to facilitate transit, national and international efforts are still required to eliminate existing physical bottlenecks - e.g. inadequate port facilities and rail or road infrastructures, poor transport equipment, insufficient telecommunication facilities - and any remaining non-physical barriers to the smooth movement of transit goods.

4. Against this background, the expert meeting will deal with the more specific issues of information systems and technologies, which are of critical importance for improving the effectiveness of transit arrangements. If exploited, opportunities to apply advanced technologies should generate increased systems reliability and consequently renew the credibility of existing transit arrangements and facilitate new ones. This report is designed to help the experts identify modalities for applying information technologies to this end. Recommendations made by the experts will have great potential for wide application and rapid use, since UNCTAD's ASYCUDA and ACIS programmes are implemented in over 70 countries.

Chapter I

THE USE OF INFORMATION TECHNOLOGY IN TRANSIT TRANSPORT OPERATIONS

1. Policy and analytical background

5. UNCTAD's work on transit transport is based on its practical experience gained throughout the world. For example, UNCTAD has promoted international conventions which seek to establish world-wide rules or standards, such as the Customs Convention on Containers, 1972, and the International Convention on the Harmonization of Frontier Controls of Goods, 1982. However, as Governments in general, and those of developing countries in particular, are often slow in ratifying or acceding to international conventions, UNCTAD has sought to reduce the number of individual legal instruments in its work on transit transport facilitation. The strategy has been to select the most critical issues in transit and consolidate them in multifold transit transport framework agreements.

6. The scope and content of each transit agreement depends on the needs of trade in each region or subregion and the extent to which the countries concerned are willing to strengthen their transit transport cooperation. UNCTAD encourages countries to widen and deepen this cooperation through the adoption of comprehensive agreements. Elements of a basic transit transport framework agreement developed and promoted by UNCTAD are outlined in schematic form in box 1.

7. Concrete programmes using information technologies should be designed to ensure optimal use of existing physical infrastructure and to reduce non-physical

barriers which impede the actual movement of goods to and from regional and international markets. However, successful implementation of information technology to improve transit transport and customs operations requires coordinated policy measures and actions by transit neighbours and the support of the international trading community.

2. Transit problems

8. Costs of transport by road or rail are much higher than those for seaborne transport. Transport operators must ensure that transport delays are minimized, that infrastructure is well maintained and that equipment is intensively utilized. Lack of control and a high risk of fraud require customs authorities in transit countries to have a deposit as a guarantee for the amount of the tariff, which ties up capital and increases the cost of trade. There can also be lengthy delays in the release of the guarantee after the goods have exited the transit country.

9. Lack of agreement to permit passage of trucks or wagons across national borders may require transport operators to transfer transit goods from one vehicle to another. Customs formalities may also require transit goods to be off loaded at border crossings for inspection. This double handling of cargo increases costs and the transit time of consignments.

10. Lack of effective control of transport equipment and cargo in transit leads to large customs guarantees, high insurance premiums, inabilities of railway operators to enter into interchange agreements, poor use of transport equipment and delays in transport. Delays in documentation arriving in the port and at border crossings slow down formalities, delay arrangements for onward transport and thus increase the transit time of goods. Delays in the processing of documentation to calculate customs and port tariffs, because of manual methods and missing information, further slow down the movement of cargo and increase costs. Because of all these problems, costs of transit to land-locked developing countries are very high (see box 2). The use of information technologies can help transit operators to improve their operations and thus reduce costs to traders.

11. In recent years, the existing international mechanisms to facilitate the international transit traffic of goods have come under pressure because of the increased amount of fraud and smuggling.[1] This has become an major issue in customs transit. Control systems for transport operators to track transit goods and systems to help customs authorities identify fraudulent activities as quickly as possible would help solve this problem. A system is needed to alert customs authorities to the non-exportation of transit goods within hours of their expected departure date.

3. Using information technology to contribute to customs transit facilitation

12. Within the context of transit arrangements, information technology can be used to help customs authorities control transit and improve the efficiency of transport operators and thus benefit traders. Flows of information, which are largely encoded in paper documents, are fast being replaced by telematic techniques. New information technology can be used, firstly, to computerize data-handling tasks undertaken by individual suppliers of transit services, including transport operators, freight forwarders, banks, insurance companies, warehouse operators, customs and providers of market information; and, secondly, to computerize information exchange between suppliers of transit services, for example between port and railway authorities, or with national customs authorities.

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[1] According to the Economic Commission for Europe's Working Party on Customs Questions Affecting Transport, as at the end of 1996, the juridical arbitration procedure between the International Road Union (IRU) and the former international insurance pool involved claims of payments of SF 250 million (US$ 200 million) (TRANS/WP.30/168, para. 29).

Box 1: Elements of a transit transport framework agreement

A. Freedom of Transit

B. Designation of Transit Routes
1. Designation of transit routes
2. Adoption of technical standards of routes

C. Maritime Ports and Frontier Facilities
1. Maritime and frontier facilities
2. Other measures designed to expedite clearance of transit traffic

D. General Conditions for Road Transport
1. Harmonization of traffic regulations
2. Vehicle specifications
3. Compulsory vehicle inspection, mutual recognition of driving licences and third-party insurance
4. Harmonization of road charges and other financial obligations
5. Liberalization of road transit services

E. General Conditions for Rail Transit

F. General conditions for Inland Water Transport

G. Information Technology

H. Customs Control
1. International customs transit regime
2. Documentation and procedures
3. Security of goods in transit
4. Temporary admission of means of transport

I. Conclusion and Performance of Contract of Carriage
1. Minimum statutory requirements of contract of carriage
2. Particulars of a consignment note
3. Liability of the carrier and compensation

J. Special Rules on Transport of Dangerous Goods and Perishable Foodstuffs

K. Institutional Arrangements

13. In customs transit transport operations, computerization and telecommunications would:

- simplify the data capture for declarants and transport operators, and reduce paperwork to a minimum;
- speed up the information flows and reduce procedural obstacles to the physical movement of goods;
- allow for tracking of consignments whenever necessary;
- allow for the monitoring of customs interventions at the various stages of the transit transport and improve the efficiency of Customs controls.

Box 2 : African land-locked countries hit by high transit transport costs

African land-locked countries continue to suffer from excessive transport costs. As a comparison with the cost of neighbouring coastal countries reveals, the high incidence of freight costs is mainly due to substantial transit transport charges. The magnitude of the problem is analyzed in UNCTAD's *Review of Maritime Transport, 1995*, according to which global transport costs in 1993, the last year for which figures are available, accounted for 5.6 per cent of world trade. Compared with this average figure, the incidence of freight costs is much higher in African land-locked countries. In Burkina Faso, for instance, the share of freight costs in c.i.f. import values was 21.7 per cent and in Mali 29.6 per cent. Similarly, Chad and Rwanda had freight ratios of 25.5 and 30 per cent respectively. The situation was somewhat less dramatic in Southern Africa, with Zambia and Zimbabwe paying freight costs of approximately 15 per cent. While these compare favourably with freight ratios of land-locked countries of other African subregions, they are still considerably higher than those of the coastal transit countries.

The general observations on the level of relative freight costs are confirmed by data on actual freight charges paid in the trade with African land-locked countries. The following table gives examples of approximate inland and ocean freight charges paid in 1995 for containerized exports. The data clearly reveal the high element of land transit transport costs as compared with ocean freight charges. Any attempt to increase the competitiveness of export goods in foreign markets by reducing transport costs will thus primarily have to aim at influencing the level and structure of costs accruing in the transit operation.

Comparison of cost of transit and ocean transport to North-West Europe in export trades of selected African land-locked countries in 1995
(rates in US$ per Twenty foot Equivalent Unit)

	Approximate land transit rate		Approximate ocean rate		Land rate factor
	Mode	Rate	Port	Rate	
Mali (Bamako)	Rail	800	Dakar	1 100	0.73
Central African Republic (Bangui)	Road	2 560	Douala	1 500	1.71
Rwanda (Kigali)	Road	2 500	Dar es Salaam	1 300	1.92
Burundi (Bujumbura)	Road	3 100	Dar es Salaam	1 300	2.38
Zambia (Lusaka)	Road	1 900	Dar es Salaam	1 300	1.46
Malawi (Lilongwe)	Road	1 600	Dar es Salaam	1 300	1.23
Malawi (Lilongwe)	Road	1 600	Durban	1 000	1.60
Malawi (Lilongwe)	Road	1 050	Nacala	1 100	0.95

Sources: UNCTAD, *Review of Maritime Transport, 1995* (UNCTAD/RMT(95)/1); and data communicated to the UNCTAD secretariat.

14. There are at present in UNCTAD, various initiatives which illustrate the potential for, and problems in, applying new information technology to improve transit operations. The most important ones are the Customs Reform, Modernization and Automation Programme (ASYCUDA[1]) and the Advance Cargo Information System (ACIS).

[1] For descriptions of these, see annexes I and II.

Customs transit information systems

15. Efficient information processing and transfer systems can substantially contribute to facilitating customs transit procedures. They will not replace the security measures and guaranteeing schemes, rather they will complement them and improve their efficiency while easing the burden for transit operators and customs staff. As a result, truck waiting times will be cut, paper documentation will be reduced to a minimum, and guarantees will be discharged without delay.

16. The first attempt to study the use of modern methods for dealing with the information accompanying the movement of goods was made in the mid-1980s in the framework of the UN/ECE Working Party on Customs Questions Affecting Transport, a subsidiary body of the Inland Transport Committee of the Economic Commission for Europe. The study concerned the possible introduction of a data carrier in the form of a micro-circuit plastic card ("smart" card).

17. The basic idea was to replace the existing paper-based TIR Carnet system by a system using a "smart card" as the access device for a dedicated network for customs transit.[3] The card would function as a portable file replacing the TIR Carnet, in addition to providing access to international road transport services such as relevant databases and catering for the payment of duties, tolls, fuel and travel expenses, etc.

18. For practical reasons and also because the benefits that could be derived from using a "smart" card were not obvious in the framework of road customs transit operations, the project did not come to fruition within the UN/ECE Working Party. The development of computerized Customs systems and efficient communication links now makes it still less attractive as far as customs control is concerned.

19. Computerization can be of great help in the management of customs transit.[4] Customs can benefit from a computerized system aimed at managing and controlling the transit procedure, as it can provide fast and secure exchange of information. Since by definition the goods under the customs transit procedure are moving, the system must be able to control them at different points and it must be located in the various places where the goods are presented to Customs. The system will be efficient if there is immediate transfer of information from one customs office to another.

Transit transport information systems

20. Parallel to dealing with the customs aspect of goods movement, physical cargo movements need to be monitored. Transport operators have installed computer-based systems to track transport equipment and consignments on all transit transport modes and at transfer points. One such system is the Advance Cargo Information System (ACIS) developed by UNCTAD, which, using existing communication systems, provides an information network linking the physical points along various surface transport routes. An important feature of any such system is the availability of a database facility for transport information, providing registered users with confidential access to the status of any particular consignment.

21. The main objective of computer-based transport logistics information systems is to help transit transport operators reduce costs and make efficient use of investments in transit facilities, by providing the core information required to

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[3]See: "Introduction of a special micro-circuit 'smart card' for international transport of goods by road, (TRANS/GE.30/R.183), 6 August 1985.

[4]Attention is drawn to the Transit Computerization Project of the Commission of the European Communities to create a New Computerized Transit System (NCTS); see working document of the Commission of the European Communities DGXXI/2128/95 Rev.2.

identify problems and to take corrective action. The benefits of such a system could be broadly perceived in terms of:

- improved information to help control the operations of individual transport operators;
- advance information on the movement of individual consignments, providing the opportunity to plan optimum use of transport networks, equipment and facilities, thus leading to improved transit times for goods;
- a database for rational corporate planning by transport operators;
- a long-term record of transport movement data to build up national and subregional databases where appropriate, and to permit governments and institutions to analyze problems in order to investigate alternative investment opportunities in transit transport facilities.

22. Ports are complex entities in which related but also opposite or competing interests converge, both private and public: shippers and lines, stevedores and insurers, surface transport operators, Customs, the Central Bank and government departments. A computerized port information system will provide the following benefits:

- Data are captured once only, and validated by the different operators, thus avoiding multiple input and associated errors, reducing paperwork and the related risk of forgery, etc.;
- At each stage of the processing, value is added to the data as the consignment file becomes more and more comprehensive, providing the next step in the chain with a more accurate and complete file;
- Relevant information is immediately available to all authorized operators, thus reducing administrative delays;
- Through a built-in electronic message facility, operators are allowed to communicate directly, avoiding unnecessary physical document transfers, and subsequent delays.

23. The railways, as single entities, have introduced logistics information systems to track equipment and cargo along their rail network. This provides reliable and real-time information to improve the quality of service offered to traders and to allow them to better plan onward transit. These systems can improve the productivity of existing equipment, thus increasing profits. Tangible benefits can be quickly achieved as a result of the introduction of information systems on railway networks. For example, the introduction of ACIS on selected African railways has effectively increased capacity by figures ranging from 30 to 67 per cent and utilization from 20 to 50 per cent. To achieve comparable growth through capital investment would cost many times more than the development and implementation costs of management information systems. Through tracking systems, the confidence of shippers can also be increased as a result of both timeliness in locating the cargo and improved overall quality of service. Further, tracking systems will facilitate traffic flows at frontiers and optimize the interchange of rolling stock between national networks involved in transit operations. Another important feature is the simplification of wagon hire formalities and payments.

24. A major share of transit cargo is generally carried by road. In terms of information systems, this creates particular problems because of the nature of the road transport industry in most developing countries. A road tracking system must have at least three subsystems, - road bill data entry recording roadway bills at a central location, a central commercial vehicle database and road statistics based on roadway bill data. Additionally, for transit purposes a border-crossing module could monitor road traffic at main border points. This cargo tracking, however, is much more difficult to achieve than it is for the other modes of transport because there are so many different-sized road hauliers using various routes, which results in a lower tracking resolution on the road system.

4. Telecommunications

25. In the 1980s, large multinationals were quick to use the new telecommunication technologies to strengthen their capacity to compete in terms of costs, innovation and product differentiation. At that time, these technologies were not globally available and general transit solutions using information technologies could not be envisioned. Today satellite links provide global coverage, and costs are rapidly coming down. This new situation offers a distinct potential for development through an enhanced integration of these smaller players in the emerging global information society (GIS).

26. A majority of multinational and large regional organizations are implementing electronic data interchange (EDI) and will soon be requiring all trading partners to integrate it into routine business procedures. There is another compelling reason to use EDI internationally. International trade, in addition to the buyer and seller, generally involves transportation carriers, freight forwarders, brokers, banks, insurers, customs administrations and other government agencies. The data entered by the initiating party are generally required by all other parties involved. EDI, using UN/EDIFACT standard messages, allows all parties to exchange these initial data without manual copying or data entry, thus reducing the amount of time involved and the number of errors.

27. Successful application of information technology for transit transport purposes greatly depends on reliable communications systems. For developing countries with an inadequate communication infrastructure, the use of satellite-based communications may be considered as a possible solution to their problems in this field. The weight and price of satellite phones using the INMARSAT satellites have been significantly reduced since these phones were introduced in 1982. Today, the lightest sets weigh well under five kilograms. Global telephone access, permitting anyone to communicate via voice, data and fax from anywhere to anywhere in the world, has become a reality with the introduction of a user-friendly and low-cost service.[5]

Chapter II

FUTURE DEVELOPMENTS

1. Customs transit information systems

28. The computerization of Customs, where appropriate, will establish a framework for the development of more effective customs transit arrangements. Information technology can be used to help combat fraud and smuggling. The development of a system to transfer information from the office of entry to a central office and then to and from the office of exit should be given priority so as to allow more effective transit.[6] For this purpose a focal point is necessary, which will be denoted as the Centre for Transit Clearance (CTC). The CTC would receive and transmit to the relevant office all information concerning the transit movement of goods and vehicles, and would deal with the follow-up of transit operations (release of global guarantees, contact with external clearance control systems, enquiry procedures, etc.). The CTC would also liaise with other customs administrations.

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[5]For users of over 200 minutes per month the monthly subscription is US$ 100 and US$ 2.40 per minute, "World Ports", special issue of the *Baltic Magazine*, February 1997, p. 86.

[6]In accordance with the Kyoto and TIR Conventions "office of departure" means any customs office at which a customs transit operation commences; "office of destination" and means any customs office at which the customs transit operation is terminated; "office en route" means any customs office where the goods are imported (office of entry) or exported (office of exit) in the course of a customs transit operation.

Information required for a transit operation

29. The Kyoto Convention (Note 1 to paragraph 12 of Annex E.1) presents the items that the declarant is normally required to declare. These data elements are listed in box 3. Additional elements relating to the driver, the carrier or the means of transport could be used by Customs for the development of an enforcement module.

Types and functions of transit messages

30. The system should be able to transfer the information messages between the different locations involved in the transit operation, and to other systems such as another customs computerized system, a cargo tracking system and so forth. The flow of information messages is reflected in figure 1. Their functions are as follows:

TAM - Transit Advance Message - allows the transfer of summary transit data to Customs for the purpose of initiating customs transit data capture and processing.

TMM - Transit Movement Message - allows the transfer of detailed transit data from a Customs office of entry to a CTC for the purpose of reporting the beginning of a Customs transit operation. The CTC records the TMM and relays it to the office of exit/destination concerned by the transit operation.

TMC - Transit Movement Correction Message - allows the correction of a TMM, e.g. in cases where essential elements of the latter e.g. (customs office of exit, time prescribed for the transport) have to be amended during a transit transport.

TCM - Transit Control Message - permits the transfer of data from an office of exit/destination to a CTC to report on the satisfactory completion of a customs transit.

TAA - Transit Arrival Advice Message - permits the transfer of data from an office of exit/destination to a CTC to report on the arrival of a transit consignment and to indicate that further controls are required before the guarantee can be released.

TEM - Transit Enquiry Message - allows the transfer of data from a CTC to an office of exit/destination when a TCM or a TAA has not been received after expiry of the time allowed for the transit transport. It requires the sending of the response or initiation the of necessary investigations.

TNR - Transit Negative Response Message - permits the transfer of data from an office of exit/destination or from a tracking system to a CTC in response to a TEM to indicate that a given consignment could not be located at the office of exit/destination or in the tracking system.

TDI - TIR Discharge Information Message - allows the transfer, from a CTC to a guaranteeing body, of data pertaining to the discharge of transit documents such as TIR Carnets.

Formalities at the office of departure/entry

Data entry

31. The information relating to a transit operation may reach an office of entry from the following sources: (a) customs messages produced by another user of the customs system Transit Advance Message (TAM); (b) advance information from the tracking system through a TAM; (c) DTI (direct trader input) from an operator/declarant concerning an international transit document (e.g. TIR Carnet) or a national transit declaration; (d) transit data entered by Customs from an international transit document (e.g. a TIR Carnet) or a national transit declaration.

Box 3: Possible data elements for customs transit messages

A computerized customs transit procedure will require the exchange of information between the different customs offices. The first part of the list below refers to those data elements from Note 1 to paragraph 12 of Annex E.1 of the Kyoto Convention, and the second part to additional elements required.

Name and address of consignor
Name and address of declarant
Mode of transport
Identification of means of transport
Seals etc. affixed
Place of loading
Office of destination
Transport unit (type, identification no.)
Marks, numbers, number and kind of packages
Description of goods[a]
Gross weight per consignment in kilos
List of documents attached[b]

Goods declaration number
Goods declaration presentation date
Goods declaration acceptance date
Kind of transit
Itinerary
Customs office of entry
Customs office of exit
Country of first destination
Time limit
Value[c]
Guarantee[d]

[a] A decision has to be taken regarding the level of detail to be retained for the commodity description and code, e.g. at the four - digit or the six - digit level. As these data will have to be captured in most cases from transport documents with only a generic description, the four-digit level is advisable.

[b] This could be replaced with reference to the TIR Carnet or other international transit document.

[c] In principle, its indication is not relevant for a transit operation, however, some countries request it, e.g. for assessing duties and taxes to which the goods are potentially liable and the amount of corresponding securities. If required, the declared value for the entire consignment could be used.

[d] Details of the undertaking given in cash, as a bond or as a written guarantee to ensure that an obligation will be fulfilled, e.g. under a transit procedure, are required.

Data validation

32. The system controls the data entry and, if required, flags the consignments for physical examination, at both departure and destination offices. This is done automatically using a selectivity system (random selection and risk analysis criteria).

Validation of guarantee

33. The guarantee is secured through an international guaranteeing system (e.g. a TIR Carnet), according to bilateral or multilateral agreements, or according to national regulations. The form and amount of the guarantee have to be established, depending on the nature of the goods (e.g. highly dutiable or not) and the status of the operator/declarant (e.g. cash deposit for an occasional operation, or general undertaking covering all operations for a given period). The system checks whether the form and amount are appropriate for the transit operation. In the case of a general undertaking, it checks whether the guarantee is not already overcommitted.

Validation of the transit declaration

34. Transit information received through a TAM from a customs system in the neighbouring country or from a national tracking system is incomplete, as a certain number of information elements become available only when the consignment reaches the customs office of entry. The TAM should thus be complemented by the declarant/transport operator or by Customs. When the information is complete the system validates the transit declaration and allocates a transaction number which will be the key for any subsequent action.

Printing the transit document

35. When there is no international transit document (e.g. TIR Carnet) covering the operation, the system prints a transit document to accompany the goods. This document may contain complete information, or be a simple authenticated printout bearing only the reference number and basic data. When TIR Carnets or other international transit documents are used, the transaction number is indicated in the box "For official use" of the voucher used for the country concerned.

Manifest discharge

36. The Bill of Lading item or items corresponding to the transit consignment is/are written off by reference to the transit declaration.

Physical inspection: Security measures

37. Goods are physically inspected at the discretion of Customs and security measures are taken (e.g. affixing of seals). The results of inspection and a report on security measures taken (e.g. number and location of seals) are indicated on the transit document.

Transit Advance Message

38. If two adjacent countries are concerned by a transit operation, a TAM can be sent by the CTC in country A to the CTC in country B.

Transit Movement Message

39. A Transit Movement Message (TMM) is sent to the CTC which records and relays it to the office of exit/destination. If a time limit is prescribed for the completion of the transit, a timer is set based on that time limit (to which an adequate grace period may be added). This is intended for those cases where the CTC does not receive, within the prescribed time limit plus grace period, a Transit Arrival Advice Message (TAA) or Transit Control Message (TCM) from the office of exit or destination indicating that the transit operation has been completed. In such cases, an inquiry procedure will be automatically triggered.

Formalities en route

40. Formalities en route will be limited to emergency cases, e.g. when road or weather conditions make it impossible to follow the prescribed itinerary or to respect the set time limit, when a vehicle breakdown or road accident has occurred, or when a police or customs control has revealed an infringement of the transit

rules. In any such cases, the competent authorities (Police or Customs) will alert the customs office of entry (e.g. by telephone, giving the transaction reference number as shown on the transit document).

41. The office of entry will send a transition Movement Correction Message (TMC) to the CTC, advising it, for example, of the new time limit; and the CTC will amend the transaction record and transmit the message to the office of exit/destination. The same procedure is followed in cases where it is necessary, for any reason, to modify the itinerary and to direct the transit transport to an office of exit/destination other than the one initially indicated.

42. The transport operator must request an authorization from the customs office of entry, which will send a TMC to the CTC. The CTC will relay the message to the initial office of exit/destination to close the procedure as far as that office is concerned, and will send a TMM to the new office of exit/destination to initiate the control procedure. The new TMM will have the same transaction reference number as the initial one.

Formalities at the office of exit/destination

43. On receipt of a TMM, a preliminary risk analysis routine may be carried out for selecting consignments that might be submitted to physical controls. When the transit consignment arrives, the office of exit/destination retrieves the relevant TMM information, entering the reference number from the transit document or TIR Carnet.

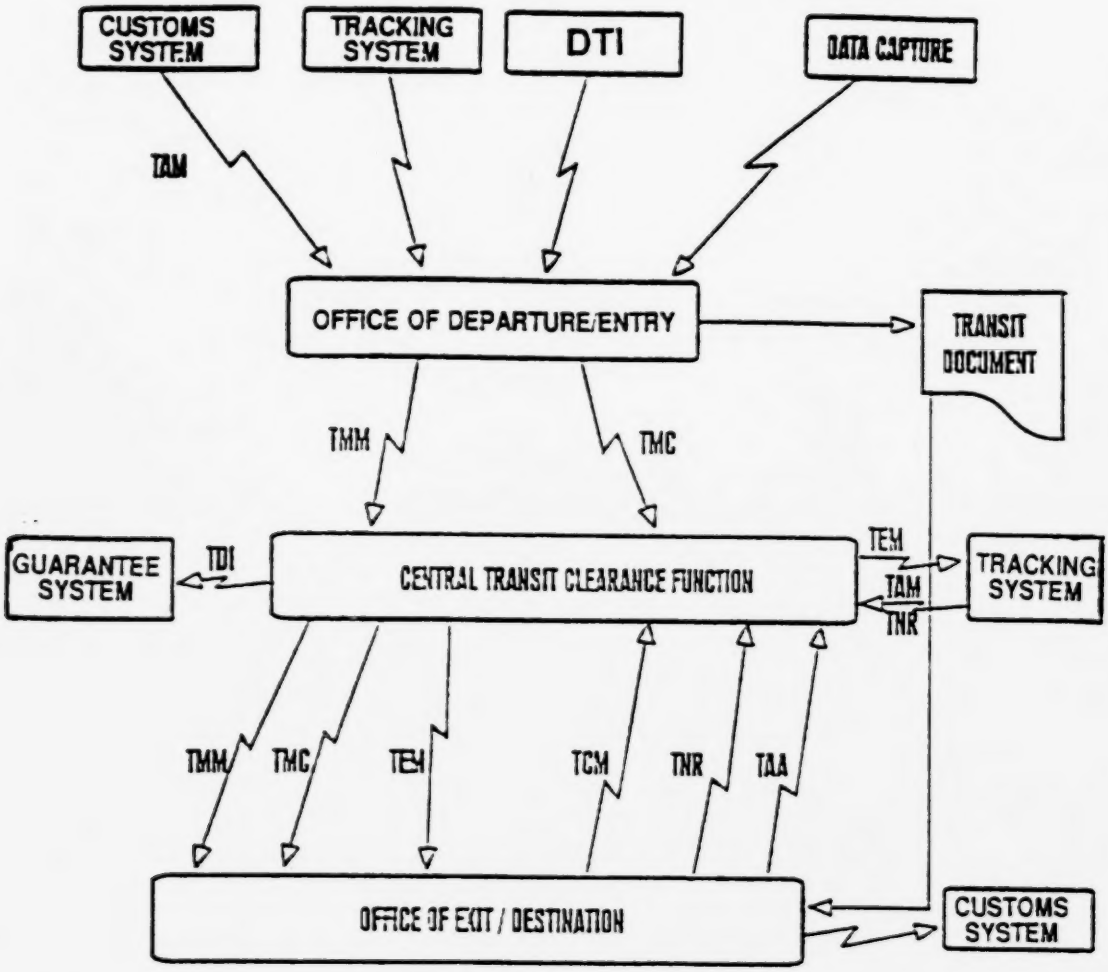
44. Physical checks and seal controls are carried out, as required. If the transit operation is completed to the satisfaction of the customs services, a TCM is sent to the CTC. If Customs are not satisfied with the result of their controls and require more investigations, a TAA is sent to the CTC, indicating that the consignment has arrived but that the guarantee cannot be discharged pending completion of the control operations. In cases where the declarant/transport operator's undertakings have not been satisfactorily discharged, Customs activate a recourse action against the local guarantor or guaranteeing association.

45. If the guarantee is in the form of a cash deposit and the transit procedure is satisfactorily completed, the office of exit/destination refunds it to the declarant/transport operator. The refund is mentioned in the TCM. Alternatively, the office of exit/destination will mention in the TCM that the deposit has not been refunded and should be repaid by the office of entry. In the case of a TIR operation, the normal "manual" procedure is performed at the office of exit/destination. When the TIR transport is terminated to the satisfaction of Customs, the Carnet should be discharged and the guaranteeing association should be informed accordingly. To that effect, the TCM will contain an indication that the TIR Carnet has been discharged. This will trigger a TIR Discharge Information Message (TDI) from the CTC to the relevant international organization.

Enquiry procedure

46. Enquiries and follow-up procedures concerning transit operations are the responsibility of the CTC. A transit Enquiry Message (TEM) will be sent automatically to the office of exit/destination if a TCM or a TAA has not been received by the CTC upon the expiry of the period of time allowed for the transport. The office of exit/destination will conduct the necessary investigations. Its response to the TEM will be either a TCM or a message indicating that this consignment could not be located, a Transit Negative Response Message (TNR). Upon receipt of a TNR, the CTC will send a TEM query to the local tracking system. This system will give information on the last reported location for the goods or indicate whether they have actually been reported as exported. The tracking system response will be sent through a TAM, but if the consignment cannot be traced, a TNR message will be sent.

FIGURE 1: Customs transit information flows



2. Data interchange between customs and transport information systems

47. Customs and transport information systems are generally developed independently, given the different requirements of the customs authorities and transport operators. In the case of transit transport, however, Customs and transport operators are merged into integrated operations, requiring data interchange.

48. In this context, particular importance is attached to the availability of port information systems. Manifest and gate pass subsystems could be used for entering data relevant for customs transit into the customs manifest subsystem. They could also be used for checking whether transit goods have actually left the country. This could be done automatically for each transit operation, confirming the actual exportation. Where customs and transport information systems are not compatible, it would probably be more realistic to limit the linkage to cases where the customs system would enquire about the status of transit goods that have not been discharged in time in the system, so as to ascertain whether or not they have actually been exported.

49. The railway information system can be consulted in order to locate transit goods that have not reached the Customs office of exit or the inland office at the time prescribed for the termination of the transit operation. The rail traffic database will include information on the last place where the goods or rail vehicles concerned were reported and the full history of each consignment trip.

50. The transport operator's information system would thus function both as one of the gates to the customs information system, in the case of transit operations initiated or ending in a port, and as recourse procedure for enquiries in cases where a customs transit is not terminated as prescribed. Such complementarity between the systems will be facilitated if both are designed to accommodate UN/EDIFACT formatted data messages for the ship cargo manifest.

51. By its very nature, road transport does not lend itself to easy tracking en route. In addition to the obligation for road vehicles to follow prescribed itineraries, this would require the installation of points for data capture (e.g. at tolls or police stations or ad hoc spots along the highways) through transponders or tracking devices, placed in the vehicles, "smart card" readers, or remote sensing through satellites and global positioning systems. The costs for these means of control might be greater than the interests at stake. A realistic approach would be to provide incentives for the use of tracking systems by road hauliers. Thus, only those companies equipped with the necessary tracking devices would be entitled to simplified customs control procedures, e.g. exemption from customs bond requirements.

3. Public and private sector collaboration

52. Collaboration between the public and private sectors involved in the transit transport is critical for the success of transit transport programmes, including introduction of information technologies. Even as many Governments retreat from commercial transport operations, they still retain the key role of financing physical transport infrastructure, maintaining and managing such infrastructure, as well as formulating and enforcing laws and regulations. For its part, the private sector, as the main provider of transport services, has first-hand knowledge of the bottlenecks and obstacles encountered in day-to-day operations, and as such is best suited to propose viable and practical solutions designed to improve transit systems. The private sector has a major stake in ensuring that transit transport facilitation measures and the use of information technologies succeed because it is a direct beneficiary of the measures designed to harmonize inter-State regulations and simplify administrative and customs procedures. The participation of the private sector in policy formulation will not only facilitate the adoption of suitable measures but will also secure its cooperation in implementing the new measures.

53. To be effective, public and private sector consultations, should be regular and institutionalized in facilitation committees. Such committees bring together representatives of all public and private parties concerned with international trade and transport facilitation in a country: governmental entities, service providers and transport users. Public and private sector collaboration should extend beyond policy formulation and introduction of new systems. Modalities should be established to ensure the sustainability of technical and investment programmes. Some initiatives have been taken by the private sector to ensure that activities and investments in particular transit corridors collectively meet users' requirements and are locally financed and maintained.

54. An important example of such an initiative is the establishment of the Beira Corridor Group (BCG). BCG is a limited liability company set up in 1986 by 240 shareholders within the Southern African region (mainly companies in Zimbabwe), with the aim of ensuring that the Beira Corridor is available to them as users. The rehabilitation of that corridor has been entrusted to the Beira Corridor Authority (BCA), which developed the corridor in line with plans established within the framework of the Southern African Development Community (SADC). BCG acts as the link between BCA and users, providing the former with feedback on the strengths and weaknesses of the corridor so that its development and operations are appropriate,

and BCG provides reliable information so that users can decide whether the corridor is an appropriate route for their cargoes. BCG thus acts as a user lobby and as an agency providing market information on the corridor.

4. Human resources development

55. The introduction of information technologies as a solution to many of the transit transport problems facing developing countries requires improvements in the knowledge and skills of those involved in policy-making and at managerial and operational levels. There is therefore a vital need to associate human resources development activities in any transit transport facilitation programme.

56. The introduction, adaptation, implementation and maintenance of systems all depend on aware and capable personnel. Workshops should be designed to present the issues and should be organized wherever there is a clear need to upgrade transit arrangements. Training materials should be developed in parallel with the development of new systems, so as to be available and accompany their introduction. In addition, a strategy for reinforcement of local training capacity should also be prepared, so that training can be run in local languages where appropriate, adapted to local context, benefit from regional cooperation, and be repeated as necessary because of changing circumstances, including staff turnover.

57. Authorities in developing countries would become more responsive to the problems of transit transport, and be more likely to establish and apply appropriate regulations, if they were provided with data and information which demonstrate clearly the nature of the problems and the benefits of programmes using information technologies. This type of information could be disseminated through information packages, formal seminars and conferences.

58. The implementation of training at managerial and operational levels would be based on modular units adapted to the application of new and constantly changing technologies. Given the linkages between information technologies in the areas of Customs, clearing and forwarding, banking and insurance, and cargo information systems, a sound training programme would ensure that the contents of training for the individual areas are coordinated.

Conclusions and recommendations

59. Although improvement of transit systems in some corridors will need significant new investments, greater attention should be given to maximizing the use of existing infrastructure. Any given infrastructure, facilities and equipment, if better managed, can be made to handle more cargo at lower cost. The use of information systems and technologies provides an opportunity to facilitate transit transport operations, strengthen customs transit control and simplify customs transit procedures. However, their successful application in developing countries requires coordinated policy and actions by transit neighbours and the support of the international community. In its efforts to minimize the number of legal instruments in the field of facilitation of transit transport operations, UNCTAD has developed and promoted multifold transit transport framework agreements which consolidate the most critical transit issues.

60. Information technology will provide increasingly important tools for the improvement of transit transport operations. It is therefore necessary to install systems along each corridor. While the need for adaptation to local conditions particularly with regard to the availability and quality of telecommunications is recognized, it is imperative - for systems to be operational - that they be computerized and allow for data exchange not only among transport operators, but also with administrations involved in transit operations, particularly customs. It is recommended that systems have the following characteristics and fulfil minimum conditions with regard to their coverage:

- They should track consignments along the transit corridors on as wide a number of modes of transport and transfer points as possible and provide information in advance of cargo arrival;

- They should provide information to be used as inputs into management information systems so as to make more efficient use of existing infrastructure and equipment. To this end, they must permit the effective implementation of equipment interchange agreements, and more effective management of transport equipment and operations;
- They must provide the basis for the establishment of performance indicators of modes of transport, transfer points and corridors as a whole. The use of such performance indicators, together with established benchmarks, should allow the evaluation of corridor performance.

61. The effective introduction of transport information systems along transit corridors requires close cooperation between private sector transport operators and public sector entities in charge of administering transit operations. In principle, this cooperation should ensure the sustainability of information systems, provide for incentives for operators to use such systems, and, on a daily operational basis, ensure the necessary interchange of transport - and cargo - related data for the implementation of transit agreements. Attention should be given to a strategy for human resources development in parallel with all technical measures taken to design and implement information systems along transit transport corridors.

62. Customs information systems should be developed to include transit modules, allowing processing and control of transit procedures and immediate transmission of information. More specifically, they should be computerized and should set up a legal framework governing international transit agreements. To this end, they should include the following features:

- common guarantees, i.e. global guarantees covering the whole transit transport and usable in all the countries that are partners in the transit agreement;
- single transit documents valid in all the countries within an economic region (transit agreement);
- mutual acceptance of documents and controls by customs administrations of neighbouring countries;
- harmonization of procedures and of messages transmitted;
- equipment standards (i.e. certification of trucks by technical control; containers).

63. UNCTAD has played an important role in helping developing countries in the introduction of advanced technologies for improving transit transport management and customs schemes and should continue to do so. Its systems developed in-house - ASYCUDA and ACIS - which are already in use or in development in many countries, help to speed and upgrade the efficiency of customs clearance and control, and to improve transit transport efficiency by tracking rolling stock and cargo along the whole transport chain. It is suggested that further UNCTAD activities in this field be focused on the development of a fully fledged transit module for ASYCUDA. Facilities for the ACIS system should be provided for sending messages on the movement of transit goods to complement the ASYCUDA transit module. Consultations should be held with the private sector and international organizations involved in transit procedures and operations during the development phase. Systems developed should take into account special conditions in least developed and land-locked countries.

64. Close collaboration between private and public sectors will have a positive impact on the choice and successful implementation of programmes using information technologies. The private sector has first-hand knowledge of the bottlenecks and obstacles and is usually best suited to propose viable and practical solutions, while Governments retain the main role of financing physical infrastructure, as well as formulating and enforcing trade and transport regulations. To facilitate inter-ministerial consultations and secure the participation of the private sector in the implementation of important decisions, facilitation bodies bringing together representatives of all public and private parties concerned with transit trade and transport facilitation should be set up nationally and regionally.

Annex I

Customs Reform, Modernization and Automation Programme (ASYCUDA)

1. The ASYCUDA programme is aimed at customs reform and modernization. It speeds up the customs clearance process through computerization and the simplification of procedures, thus minimizing administrative costs to the business community and the national economy. One of the objectives of ASYCUDA is to increase customs revenue, which is the largest contributor to the budget in many countries. It does this by ensuring that all goods are declared, that duty/tax calculations are correct and that exemptions are properly processed. The system produces reliable and timely external trade and fiscal statistics to assist the economic planning process.

2. The major objective is an efficient implementation of the system with a full transfer of technological and functional know-how to the national customs administrations at the lowest possible cost. ASYCUDA also introduces international standards and active cooperation among the growing number of user countries, increasing mutual benefits. It is a computerized customs management system which covers most foreign trade procedures. The system handles manifests, customs declarations, accounting transactions, selectivity and statistics.

3. ASYCUDA is an open system: the software operates on all types of hardware in a client/server architecture. Transaction and control data are recorded in an RDBMS (Relational Data Base Management System). It takes into account all international codes and standards relevant to Customs processing as established by the International Organization for Standardization, the World Customs Organization and the United Nations. ASYCUDA can be configured to satisfy national characteristics such as individual customs regimes, national tariff in the customs regulations and legislation. The flexibility of the system allows an easy incorporation of any updates in customs regulations. It also provides for electronic data interchange between traders and Customs using EDIFACT rules and via a specific module called the A++ Gate.

4. The impact of the ASYCUDA implementations can easily be illustrated with a few examples. Ghana and Mauritius have reduced average clearance time from a week to half a day. During the first three months of ASYCUDA operations, Sri Lanka recorded an increase in customs revenue of US$ 25 million. In Colombia, improved customs operations through ASYCUDA have led to savings in stock levels and storage at Petroquimica Colombia S.A. valued at US$ 4 million annually. In other countries the results were less impressive, mainly because of resistance to the in-depth reforms of the customs system that the implementation of the programme requires.

5. Overall, more than 70 countries world-wide have now adopted the ASYCUDA programme and 60 are using it on a regular basis. A conservative estimate shows that in 1996 world-wide international trade to a value of more than US$ 200 billion was controlled by the ASYCUDA system. This produced in 1996 a total increase in revenue of at least US$ 1 billion, and it has reduced the cumulative clearance time of all transactions by more than 50,000 days.

Annex II

Advance Cargo Information System (ACIS)

1. ACIS is a logistics information system designed to improve transport efficiency by tracking equipment and cargo on the modes (rail, road, lake/river) and at the interfaces (ports, inland clearance depot (ICDs) and providing information in advance of cargo arrival. ACIS provides both public and private transport operators and ancillaries with reliable and real-time data on transport operations, such as the whereabouts of goods and transport equipment, and thus improves day-to-day management and decision-making. It also produces regular performance indicators which enable management to remedy deficiencies and to make full use of the existing infrastructure and equipment capacity.

2. Once installed at the national and subregional levels, ACIS could provide data for macroeconomic planning to foster the optimal modal distribution patterns. It will play an important role in the development of trade relations and in reinforcing subregional integration, because it will enable transport operators to communicate, through modes and interfaces and over borders, the vital information which they require in order to improve their efficiency, thus reducing the costs and time of carriage along transport corridors.

3. ACIS relies heavily on information technology, and has been designed for use in difficult environments. It provides users that have information networks with a readily available microcomputer technology using existing communication software. Each ACIS module is designed to be a stand-alone subsystem comprising microcomputer hardware and software packages, and can be run on either a single microcomputer or a local network of microcomputers, depending on the size and needs of the operator.

4. ACIS started in 1988 and is operational or being installed in 14 countries: Bangladesh, Burkina Faso, Cameroon, Côte d'Ivoire, Ghana, Kenya, Malawi, Mali, Senegal, Sudan, Uganda, United Republic of Tanzania, Zaire and Zambia. The railway tracking module - RailTracker - is already producing concrete results: shippers and private or public freight forwarders now have direct access to several railway databases - and in some cases this access is "live" on public telephone lines or on the Internet so as to obtain current information on the movements/status of consignments/containers. For the 15 railways currently using RailTracker, benefits comprise better use of transport equipment (locating equipment, quicker turnaround times enabling wagon fleets to generate more revenue, simplified maintenance monitoring), reduction in transit times of goods (facilitation of traffic flows at border crossings and interchange of rolling stock between networks, simplified wagon hire compensation formalities) and improved quality of transport services offered to the customer with data on cargo whereabouts, thereby facilitating off-take and delivery as well as reduction of insurance costs.

5. Programme promotion, development, upgrading, quality control and system maintenance will continue, and funding will be sought in accordance with new requests. Typically for a medium sized railway, implementation takes 18 months and costs US$ 1 million. Contributions so far have been received from multilateral sources (European Union and World Bank) and from bilateral sources, France and Germany.